WHAT IS CLAIMED IS:

1. A metering pump (10) comprising,

a first cylinder (32A) having a first cylinder lower end and a first cylinder upper end,

a first piston (30A) designed and arranged for reciprocation within said first cylinder and having a first piston lower end (54A) disposed in said first cylinder and a first piston upper end extending above said first cylinder upper end,

a first valve assembly (60A) fluidly coupled to said first cylinder lower end and arranged and designed to allow fluid entry into said first cylinder lower end through a first inlet port (64A) and allow fluid exit from said first cylinder lower end through a first outlet port (66A),

a first tubular diaphragm (33A) having a first diaphragm upper end sealingly coupled to said first piston lower end and a first diaphragm lower end sealingly coupled to said first cylinder lower end, with a convolution (52A) between said first diaphragm upper end and said second first diaphragm lower end,

a second cylinder (32B) having a second cylinder lower end and a second cylinder upper end,

a second piston (30B) designed and arranged for reciprocation within said second cylinder (32B) and having a second piston lower end disposed in said second cylinder (32B) and a second piston upper end extending above said second cylinder end,

a second valve assembly (60B) fluidly coupled to said second cylinder lower end and arranged and designed to allow fluid entry into said second cylinder lower end through a second inlet port (64B) and allowing fluid exit from said second cylinder lower end through a second outlet port (66B),

a second tubular diaphragm (33B) having a second diaphragm upper end sealingly coupled to said second piston lower end and a second diaphragm lower end sealingly coupled

to said second cylinder lower end, with a convolution (52B) between said second diaphragm upper end and said second diaphragm lower end,

a motor (22) with a linkage coupled to said first piston upper end, to said second piston upper end, to said first valve assembly and to said second valve assembly, whereby

said first and second piston (30A, 30B) are arranged to reciprocate in opposite directions within respective said first and second cylinders (32A, 32B), and

said first valve assembly opens said first inlet port (64B) and closes said first outlet port (66A) while said first piston (30A) is moving upward in said first cylinder (32A) and said first valve assembly closes said first inlet port (64A) and opens said first outlet port (66A) while said first piston (30A) is moving downward in said first cylinder (32A), and

said second valve assembly opens said second inlet port (64B) and clears said second outlet port (66B) while said second piston (30B) is moving upward in said second cylinder (32B) and said second valve assembly closes said second inlet port (64B) and opens said second inlet port (66B) while said second piston (30B) is moving downward in said second cylinder (32B).

2. The metering pump (10) of claim 1 further comprising,

a first cap (54A) fixing said first diaphragm (33A) upper end to said lower end of first said piston (30A), and

a second cap (54B) fixing said second diaphragm (33B) upper end to said lower end of said second piston (30B).

3. The metering pump (10) of claim 1 further comprising,

a first housing (56A) fixing said first diaphragm (33A) lower end to said first cylinder lower end, and

a second housing (56B) fixing said second diaphragm (33B) lower end to said second cylinder lower end.

4. The metering pump (10) of claim 1 wherein

said motor is an electric motor (22).

5. The metering pump (10) of claim 4 wherein

said electric motor (22) is a two direction motor and said linkage includes a switching device for changing the direction of rotation of said motor.

6. The metering pump (10) of claim 4 wherein

said electric motor (22) is a single directional motor.

7. A metering pump (10) comprising,

a first cylinder (32A),

a first piston (30A) designed and arranged for slidable and dynamically sealed movement within said first cylinder and having a lower end disposed in said first cylinder (32A) and an upper end extending above said first cylinder,

a first three-way valve (60A) having a first inlet port (64A), a first common port (61A) and a first outlet port (66A) with said first common port (61A) fluidly coupled to a lower end of said first cylinder (32A), said first three-way valve having a suction position wherein said first common port (61A) is fluidly coupled only to said first inlet port (64A), and a discharge position wherein said first common port (61A) is fluidly coupled only to said first outlet port (66A),

a second cylinder (32B),

a second piston (30B) designed and arranged for slidable and dynamically sealed movement within said second cylinder (32B) and having a lower end disposed in said second cylinder (32B) and an upper end extending above said second cylinder,

a second three-way valve (60B) having a second inlet port (64B), a second common port (61B) and a second outlet port (66B) with said second common port (61B) fluidly coupled to a lower end of said second cylinder (32B), said second three-way valve (60B)

characterized by having a suction position wherein said second common port (61B) is fluidly coupled only to said second inlet port (64B), and a discharge position wherein said second common port (61B) is fluidly coupled only to said second outlet port (66B),

a motor (22),

a transmission mechanism coupled between said motor (22) and said upper end of said first piston (30A) and said upper end of said second piston, said transmission mechanism arranged and designed to transfer rotative motion from said motor (22) into reciprocating motion of said first piston (30A) in said first cylinder (32A) and simultaneous oppositely directed reciprocating motion of said second piston (30B) within said second cylinder (32B), and

an actuator linkage (47, 70) coupled to said transmission mechanism (26, 28A, 28B) and to said first and second three-way valves (60A, 60B),

said actuator linkage when placed in a first position arranged to seat said first three-way valve (60A) in said suction position and said second three-way valve (60B) in said discharge position when said second piston (30B) is moving downward in said second cylinder (32B) and said first piston (30A) is moving upward in said first cylinder (30A), and

and said actuator linkage when placed in a second position arranged to seat said first three-way valve (60A) in said discharge position and said second three-way valve (60B) in said suction position when said second piston (30B) is moving upward in said second cylinder (32A) and said first piston (30A) is moving downward in said first cylinder (30A), and

a switching mechanism (70) coupled to at least one of said first and second pistons and which is designed and arranged to reverse angular direction of said rotative motion of

said motor, thereby reversing reciprocating direction of said first and second pistons (30A, 30B).

8. The metering pump (10) of claim 7 wherein said switching mechanism (70) is a snap action arrangement designed to cause a substantially instantaneous change of angular direction of said rotative motion of said motor with a concurrent substantially instantaneous switching of said valve actuator linkage between said first and second positions.

9. The metering pump (10) of claim 8 wherein, said snap action arrangement includes,

a pin (86) connected to a top end of said second piston (30B),

a yoke (74) having a neck (88) which slidably captures said pin (86), and an arm (77), said yoke being rotatably coupled about a fixed point (78),

a lever (76) resiliently coupled between said actuator linkage (47, 70) and said arm (76) of said yoke, whereby

when said second piston (30B) moves to a downward position, said lever (76) snaps to an upper position within said yoke (74) thereby causing said actuator linkage to snap to an upper position, and vice versa.

10. The metering pump (10) of claim 7 wherein,

said first inlet port (64A) and said second inlet port (64B) are fluidly coupled.

11. The metering pump (10) of claim 7 wherein,

said first outlet port (66A) and said second outlet port (66B) are fluidly coupled to form a common discharge line (36).

12. The metering pump of (10) claim 11 further comprising,

a flow meter (38) fluidly coupled to said common discharge line (36).

13. The metering pump (10) of claim 7 further comprising,

a remotely mounted control panel (12), electrically coupled to said motor (22) and said flow meter (38) and designed and arranged for control of said motor by differencing a

flow rate signal from said flow meter (38) with a signal representative of a desired flow rate and sending a signal to said motor in response to a difference.

14. The metering pump (10) of claim 7 further comprising,

a tank (20), with said first inlet port (64A) and said second inlet port (64B) disposed in said tank.

15. The metering pump (10) of claim 7 wherein,

said switching mechanism includes a toggle switch (94) connected to said actuator linkage (47, 72) and electrically coupled to said motor (22) for reversing direction of rotation of said motor (22).